

QUALSTAR CORPORATION
PROCEDURE
FOR

1052 FINAL TEST

DRAWING NUMBER: 400002

REVISION: CX

===== CHANGE HISTORY =====

LTR	DESCRIPTION	DATE	BY	APPROVED
A	PRODUCTION RELEASE	03/14/90	JG	RAN
B	EN182	11/12/90	JG	RAN
CX	REVIEW COPY	07/23/91	JG	

A.0 Results Logging.

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As each test sequence is completed stamp date and Operator ID in the appropriate block on the Production Traveler. Enter values or check boxes when the individual tests are completed.

When units fail, enter as many comments as is appropriate in the reason for rejection portion of the form.

Wrt/Cont is PCBA PN 500057-01-3

Rd/Form is PCBA PN 500047-01-4

PS/Servo is PCBA PN 500087-01-0

1.0 Continuity Test - Perform Procedure 400003

2.0 Hipot test - Perform Procedure 400003

3.0 +5 Volts.

- 3.1 Set +5 volts by adjusting R24 on PS/Servo PCBA. Use a digital voltmeter between the TP5(G) and TP4(+5V) test points on the Wrt/Cont PCBA. The adjustment must be between +5.0 and +5.1. Enter the value on the traveler.

4.0 Motor Checks

- 4.1 SWA switches: 1 and 3 ON.
- 4.2 Hold (stall) the take up hub by hand. Push LOAD to turn the take up motor on. There must not be any rough motion felt while turning the motor at least one full revolution against its torque. Turn the motor off by pushing the FPT switch.
- 4.3 Hold (stall) the supply hub by hand. Push 3200 to turn the supply motor on. There must not be any rough motion felt while turning the motor at least one full revolution against its torque. Turn the motor off by pushing the FPT switch.
- 4.4 Free run the take up motor by pushing the LOAD switch. There must not be any unusual noises. Stop the motor using the FPT switch.
- 4.5 Free run the supply motor by pushing the 3200 switch. There must not be any unusual noises. Stop the motor using the FPT switch.

5.0 EOT and BOT adjustments.

- 5.1 SWA switches: 1 ON.
- 5.2 Thread, but do not load an EOT/BOT test tape. Remove slack from the threaded tape.
- 5.3 Position an untabbed portion of 3M700 tape at the EOT/BOT sensors. Adjust R1 on the Switch PCBA until TP1 of the Switch PCBA is between +2.48v and +2.52v.
- 5.4 Position the 3M-700 BOT tab at the EOT/BOT sensors. The LOAD LED must be flashing and TP1 must be more positive than +4.0 volts.
- 5.5 Position the 3M-700 EOT tab at the EOT/BOT sensors. The FPT LED must be flashing and TP1 must be less positive than +1.0 volts.
- 5.6 Position an untabbed portion of 3M777 tape at the EOT/BOT sensors. TP1 must be between +2.2 and +2.8 volts.
- 5.7 Position the 3M-777 BOT tab at the EOT/BOT sensors. The LOAD LED must be flashing and TP1 must be more positive than +4.0 volts.
- 5.8 Position the 3M-777 EOT tab at the EOT/BOT sensors. The FPT LED must be flashing and TP1 must be less positive than +1.0 volts.

6.0 Tach adjustments.

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6.1 Scope: 100us/div.

CH1 - 2v/div TP17(TA) on Wrt/Cont PCBA
CH2 - 2v/div TP18(TB) on Wrt/Cont PCBA
Synch positive on CH2

SWA switches: 1 ON.

6.2 Free spin the tach roller. Adjust R2 and R3 on the Switch PCBA for about a 50% duty cycle indication of the TA and TB signals respectively.

6.3 CH1 probe to TP11(TFWD) on the Wrt/Cont PCBA.

Physically adjust the position of Tach A sensor so that it is about 180 degrees across from the Tach B sensor and also so that the TFWD signal is low while spinning the tach roller CCW.

6.4 Scope: Change to 20us/div. CH1 probe back to TA TP.

6.5 Load a scratch tape on the drive and start 50 ips forward tape motion (3200 LED off). Adjust R2 and R3 so that TA and TB signals have a 45% to 55% duty cycle.

Fine adjust the Tach A assembly (physically) for an 85 to 95 degree lag phase shift from TA to TB. DO NOT adjust phase using R2 or R3.

Stop forward motion and start reverse motion. TB must lead TA by between 85 and 95 degrees.

6.6 Start forward tape motion at 50 ips and observe the next TB positive transition. It must be between 195 and 205 us including all jitter.

Observe the next TA positive transition. It must be between 140 and 160 usec including all jitter.

6.7 Scope: Change to 50us/div.

Set the drive for 25 ips by turning the 3200 indicator on.

Start forward tape motion and observe the next TB positive transition. It must be between 390 and 410 usec including all jitter.

Observe the next TA positive transition. It must be between 280 and 320 usec including all jitter.

6.8 Stop forward tape motion and start reverse tape motion. TA must lag TB by between 85 and 95 degrees.

7.0 Head Position Adjustment.

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7.1 Scope: 100 us/div

CH 1 - 1v/div TP1 of CH2 Read/Form PCBA
CH 2 - 2v/div ACQUIRE TP on Read/Form PCBA
Synch positive on CH 2.

SWA switches: 1 and 2 ON.

Move potentiometers settings on all Read Channel PCBAs to about 3 o'clock. (Full CCW is about 9 o'clock.)

7.2 This procedure only applies to 3200 CPI density and only in the preamble field of all ones. Check that the 3200 LED is ON. Barely loosen the two screws mounting the read/write head.

7.3 Load a scratch tape on the drive. Press FPT to stop motion, then push LOAD to initiate writing.

7.4 Observe if there is any change in preamble amplitude while rotating the head CW and CCW in the plane of the deck.

7.5 If there is change in amplitude while rotating the head, then rotate the head to a position of maximum preamble amplitude and tighten the head mounting screws.

If there is no change in amplitude while rotating the head, stop tape motion, unload the tape, adjust the head position to 5 degrees using protractor tool number 600131 and tighten the head mounting screws.

8.0 Read Amplifier Level Adjustment.

8.1 Scope: 50 us/div

CH1 - 1v/div TP3 of CH2 Read Channel PCBA
CH2 - 2v/div ENVSUM TP on Read/Form PCBA
Synch positive on CH 2.

SWA switches: 1 and 2 ON.

8.3 PE 1600 CPI Amplitude Adjustment.

Load a CALPE tape on the drive. Press FPT to stop tape motion, turn the 3200 LED off, then push LOAD to initiate writing 1600 CPI blocks.

Using the R4 potentiometer for CH2, adjust the peak-to-peak amplitude of the read signal preamble to 1.33 times the calibration value of the CALPE tape.

Move the CH1 probe to all other Read Channel TP3 and use the appropriate R4 to adjust the same preamble peak-to-peak amplitude.

8.4 PE 3200 CPI Read Amplitude Check.

There is no 3200 read adjustment, only verification of amplitude. Set the drive to write forward at 25 ips with the 3200 LED on. The amplitude of the preamble at TP 3 of each read channel must be between 1.2 and 1.7 volts peak-to-peak.

8.5 Tracking Oscillator Adjustment.

Scope CH1 - 20mv/div to TP10 of the Rd/Form PCBA.

Change to writing blocks at 1600 CPI. Adjust R28 on the Rd/Form PCBA to bring the steady state level as during the read data time to the same steady state level during gap time. Ignore any transients and the steady state level while writing.

9.0 Skew and Tracking Adjustments.

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9.1 Scope: 5us/div

CH1 - .5v/div TP1 of CH5 Rd/Form PCBA
CH2 - .5v/div TP1 of CH4 Rd/Form PCBA
Synch positive on CH1

9.2 Place special test cable from write head to J10 of Read/Form PCBA, bypassing the Preamp PCBA. Load a Head Alignment (Skew) Tape (with write ring removed) on the drive.

9.2 The tape guides are assembled with a .004 shim between the casting and the tape guide. During the adjustments it is permissible to add up to two .001 shims to the .004, or to replace the .004 with two or three .001 shims. In no case should a tape guide have fewer than .002 or more than .006 total beneath it. Always observe these limits.

The first step in adjusting the skew should be to reduce shims under one guide, removing .001 at a time and checking skew after each. Only if this fails to bring skew to within specification, should shims be added to the other guide.

9.3 Start forward tape motion at 50IPS. Observe if the tape is rubbing so hard against either inside edge of the tach roller guide so as to cause the tape to curl as it enters the guide. If curl occurs then the upper fixed guide should be shimmed so as to move the tape away from the edge being contacted. Watch for excessive edge contact as skew is being adjusted.

9.4 Skew is measured between the positive peaks of the signals. If the skew is greater than 5 usecs, Change guide shimming to minimize the skew. If CH4 peak comes before the CH5 peak, reduce shims under the upper guide first. If it comes after, reduce shims under the lower guide first.

9.5 If the allowable shim content does not provide proper tach roller contact or skew less than 5 usec, the head should be replaced. If the head replacement fails to solve the problem the tach roller should be replaced next. Lastly the tape guides should be replaced one at a time. If skew is still not within specification, the casting may be warped and the drive must be rejected pending inspection.

9.6 Measure all other channels referenced to CH5. If skew at any channel is more than 5 usecs, then further change shimming so as to reduce that channels skew. After any change recheck all other channels, particularly CH4. If all channels cannot be brought to within 5 usecs total skew, then change parts as above.

9.7 Check track position using Procedure 400006. If shimming changes are made to the unit to correct track position, recheck skew per section 9.0.

9.8 Enter the ending amount of shimming on the traveler, e.g. 4X2, where the 4 is for the upper guide and the 2 is for the lower guide.

10.0 KWIK and Interchange Tests.

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- 10.1 Connect the unit to the computer by attaching J1 & J2 controller cables to connectors J1 & J2 of the drive.
- 10.2 Verify date & time (within 5 minutes) using an EXERT 'TIME' command before beginning the test. Exit to DOS and reset if necessary.
- 10.3 Load a 10.5" tape reel on the drive.
- 10.4 Enter an EXERT 'KWIK' command. At the comment request, enter station number as ST#xx, tape serial number as TAPE#xxx and drive serial number as SERIAL#xxxxxxx.
- 10.5 Press 'return' on a blank comment line to begin test. The test takes about 15 minutes. EXERT will display "PASSED" or "FAILED" at the bottom of the display. QC Acceptance limits are built into EXERT and are used to determine pass or fail of the test.
- 10.6 If the unit fails the KWIK test, write the reasons for rejection on the traveler and move the unit to rework area.
- 10.7 If the unit passes the KWIK test, stamp and date the unit traveler for the appropriate KWIK test.
- 10.8 If the unit has passed the KWIK test, load a prewritten 3200 I-x interchange test tape. Enter an EXERT 'D32' command to ensure that drive and EXERT are in 3200 CPI.

Enter an EXERT 'READ 2' command to read the tape twice (once forward and once reverse). The unit shall read all blocks without error or the test shall be considered failed. If the test fails, the head shall be changed and the test procedure restarted at Section 7.0.

11.0 Burn-in/Mechanical Test.

SWA switches: all OFF.

- 11.1 Total burn-in time shall be 72 hours.
- 11.2 Traveler must be stamped with the time and date at the start of burn-in test using the burn-in clock.
- 11.3 If the unit fails during burn-in, stamp the traveler out of burn-in using the burn in clock. Log the failure in the Stop Burn-in block and on the Unit Traveler. Move the unit to the rework area.
- 11.4 Mount and thread a 10" burn-in reel of tape. Hold the FPT and 3200 switches down and then press the LOAD switch momentarily. The unit should load, rewind to BOT and then be in the burn-in exercise routine.
- 11.5 Cycle units off and on and restart burn-in test mode according to the following schedule:

OFF	ON	OFF	ON
7:30am	8:00am	9:15am	9:45am
OFF	ON	OFF	ON
12:15pm	12:45pm	2:15pm	2:45pm
- 11.7 After the unit has burned-in for 72 hours examine all parts in the tape path for excess dirt. Any parts found to be damaging the tape must be replaced. Stamp the traveler with the burn-in clock at the STOP BURN-IN block location and put technician stamp on the traveler.
- 11.8 Clean the tape path and then repeat the KWIK and Interchanges Tests Section 10.0

12.0 QCT Computer Test.

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- 12.1 Connect the unit to the computer by attaching J1 & J2 controller cables to J1 & J2 of the drive.
- 12.2 Verify date & time (within 5 minutes) using an EXERT 'TIME' command before beginning the test. Exit to DOS and reset if necessary.
- 12.3 Load a 10.5" tape reel on the drive.
- 12.4 Enter a EXERT 'QCT' command and answer the questions put forth appropriately. At the comment request, enter station number as ST#xx, tape serial number as TAPE#xxx and drive serial number as SERIAL#xxxxxxx.
- 12.5 Press 'return' on a blank comment line to begin the test. The test takes about 15 hours. EXERT will display "PASSED" or "FAILED" at the bottom of the display. QC Acceptance limits are built into EXERT and are used to determine pass or fail of the test.
- 12.6 If the unit passes the QCT test, stamp and date the unit traveler for FINAL QCT TEST. Print the 'SUMMARY' QCT results on the back of the traveler.

Clean the tape path and move the unit to the final inspection area.
- 12.7 If the unit fails the QCT test, write the reasons for rejection on the traveler and move the unit to the rework area.
- 12.8 SCSI Test. (TBD).

13.0 Logging Data.

Transfer all log files, failing and passing units, from the individual log disks to the master computer storage disk. Generate the summary printout from the results. (Presently this task is being performed by Sustaining Engineering).

14.0 Move the unit to the Final Inspection area.